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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/809,971

03/26/2004

Myunghee Lee

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AVAGO TECHNOLOGIES, LTD.  
P.O. BOX 1920  
DENVER, CO 80201-1920

EXAMINER

KIM, DAVID S

ART UNIT

PAPER NUMBER

2613

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/809,971

Applicant(s)

LEE ET AL.

Examiner

David S. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 March 2004 and 31 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### Drawings

1. Figures 1 and 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1-2 and 7-9** are rejected under 35 U.S.C. 102(b) as being anticipated by Doh et al. (EP 1 187 373 A2, hereinafter "Doh").

**Regarding claim 1**, Doh discloses:

An optical receiver, comprising:

a photodetector (e.g., 11 in Fig. 1) receiving an optical signal and generating a corresponding current signal;

a gain stage (e.g., 12 and 13) coupled to the photodetector receiving the corresponding current signal and converting it to a corresponding voltage signal; and

a clock data recovery (CDR) circuit (e.g., 15) directly coupled to the gain stage receiving the corresponding voltage signal, extracting clock information from the corresponding voltage signal, and regenerating the corresponding voltage signal to reduce jitter (suppression of jitter in paragraph [0002]).

**Regarding claim 2**, Doh discloses:

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An optical receiver as in claim 1, wherein the gain stage is a transimpedance amplifier circuit (transimpedance amplifier in paragraph [0003]) having a first frequency response (frequency response of some kind is inherent).

**Regarding claim 7,** Doh discloses:

A method for receiving an optical signal, comprising:  
converting (e.g., 11 in Fig. 1) the optical signal into a corresponding current signal;  
converting the corresponding current signal into a corresponding voltage signal with a gain stage (e.g., 12 and 13);  
extracting clock information from the corresponding voltage signal (e.g., 15); and  
regenerating the corresponding voltage signal to reduce jitter (regeneration of signal and suppression of jitter in paragraph [0002]).

**Regarding claim 8,** Doh discloses:

A method as in claim 7, further comprising:  
(e.g., amplifiers 12 or 13) compensating for attenuation in the corresponding voltage signal, prior to extracting clock information.

**Regarding claim 9,** Doh discloses:

A method as in claim 8, wherein the gain stage is a transimpedance amplifier (transimpedance amplifier in paragraph [0003]) having a first frequency response (frequency response of some kind is inherent).

**Claim Rejections - 35 USC § 103**

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly

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owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Doh.

**Regarding claim 3**, Doh does not expressly disclose:

An optical receiver as in claim 2, wherein the transimpedance amplifier circuit and the CDR circuit are formed on a single chip.

However, integration of circuitry is extremely well known in the art. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to form these circuits of Doh on a single chip. One of ordinary skill in the art would have been motivated to do this for common benefits of integration of circuits on a single chip, such as more compact size, economies of scale, and faster operation speeds.

7. **Claims 4-6 and 10-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Doh as applied to the claims above, and further in view of Swenson et al. (U.S. Patent Application Publication No. US 2005/0191059 A1, hereinafter "Swenson").

**Regarding claim 4**, Doh does not expressly disclose:

An optical receiver as in claim 2, further comprising:

a compensation circuit interposing the transimpedance amplifier circuit and the CDR circuit, the compensation circuit having a second frequency response that is approximately the inverse of the first frequency response of the transimpedance amplifier circuit.

However, Swenson discloses an optical receiver with a compensation circuit interposing a transimpedance amplifier circuit and a CDR circuit (Swenson, Fig. 3 in view of paragraph [0072]). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to include such a compensation circuit in the receiver of Doh. One of ordinary skill in the art would have been motivated to do this to compensate the degradation of low-cost low speed components, such as the transimpedance

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amplifier (Swenson, components of paragraph [0037] in view of compensation/equalization of paragraphs [0038] and [0042]).

Additionally, it is standard practice to provide compensation/equalization of a first frequency response by using the corresponding inverse frequency response. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to arrange the compensation circuit of Doh in view of Swenson to have a second frequency response that is approximately the inverse of the first frequency response of the transimpedance amplifier circuit. One of ordinary skill in the art would have been motivated to do this since it is generally known that compensation/equalization using the inverse frequency response of a component/channel provides flat, clean signal results that signify the removal of degradation of that component/channel.

**Regarding claim 5,** Doh in view of Swenson discloses:

An optical receiver as in claim 2, further comprising:

a compensation circuit interposing the transimpedance amplifier circuit and the CDR circuit, wherein the compensation circuit is an equalizer (Swenson, equalizer in Fig. 3 in view of paragraph [0072]).

**Regarding claim 6,** Doh in view of Swenson discloses:

An optical receiver as in claim 5, wherein the equalizer includes a synthesis filter (Swenson, e.g., one can consider filter(s) 605 and/or 610 to “synthesize” a compensating signal).

**Regarding claim 10,** Doh in view of Swenson discloses:

A method as in claim 9, wherein compensating for attenuation is performed by a compensation circuit having a second frequency response that is approximately the inverse of the first frequency response (see treatment of claim 4 above).

**Regarding claim 11,** Doh in view of Swenson discloses:

A method as in claim 7, wherein the corresponding voltage signal is equalized, prior to extracting clock information (Swenson, equalizer in Fig. 3 in view of paragraph [0072], prior to CDR).

**Conclusion**

8. The references made of record and not relied upon are considered pertinent to applicant's disclosure. Siegel et al. is cited to show another compensation circuit (e.g., Fig. 3) in an optical receiver. Kasper is cited to show another compensation circuit (e.g., equalizers in Fig. 3) in an optical receiver. Kurchuk is cited to show another compensation circuit (e.g., 306 in Fig. 3) in an optical receiver. Chiang is cited to show another compensation circuit (e.g., equalizers in Fig. 1) in an optical receiver. Krishnaswami is cited to show another compensation circuit (e.g., 32 in Fig. 2) in an optical receiver. Doh et al. (EP 1 187 373 A3) is cited to show a search report of the European Patent Office for Doh (EP 1 187 373 A2). Pepeljugin et al. is cited to show another compensation circuit (e.g., equalizer in Fig. 1) in an optical receiver.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSK

  
**KENNETH VANDERPUYE**  
**SUPERVISORY PATENT EXAMINER**